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Inventor : Takeshi SUZUKI
Title : DIGITAL PRINTER AND DIGITAL CAMERA
Assignee : Olympus Optical Co., Ltd.

Enclosed herewith please find the following documents in the above-identified application for United States Letters Patent:

32 Pages of Specification including Abstract and Claims
14 Numbered Claims Calculated as 14 Claims for Fee Purposes
7 Sheets of Drawing Containing Figures 1A to 7. (Formal)
X Declaration and Power of Attorney
X Priority is Claimed under 35 U.S.C. §119:
Convention Date September 28, 1999 for Japan Appln. S.N. 11-274505
X Certified Priority Application
X PTO-1449 with 2 references
X Assignment
X Return-Addressed Post Card

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TITLE OF THE INVENTION

DIGITAL PRINTER AND DIGITAL CAMERA

CROSS-REFERENCE TO RELATED APPLICATIONS

5 This application is based upon and claims the benefit of priority from the prior Japanese Patent Application No. 11-274505, filed September 28, 1999, the entire contents of which are incorporated herein by reference.

BACKGROUND OF THE INVENTION

10 This invention relates to a digital printer and a digital camera, and more particularly to a digital printer and a digital camera, which can print image with attendant circumstances such as a photography date attached thereto.

15 Various types of digital video printers for printing photographed images that are obtained by a digital device such as a digital camera have recently been developed. In these printers, photographed images stored in a memory device, for example, a memory card
20 can easily be printed.

Further, there is a recent demand for developing a digital camera provided with a printing mechanism, or a portable printer, which enables printing of a photographed image immediately after photographing
25 it.

A technique is well known, which is for simultaneously recording image data and information

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such as a photography date, and printing the image data and the photography date superimposed thereon. For example, Japanese Patent Application KOKAI Publication No. 9-322102 discloses an apparatus in which, when printing a photograph with character data such as a date superimposed thereon, the position or the color of the date can be selected by operating a mouse.

In the above described publication, however, the orientation of character data relative to image data is fixed. In other words, the user cannot select the orientation of character data when printing image data together with the character data. In general, this does not cause any problem when printing data obtained by operating the digital camera held in a landscape position. However, in the case of data obtained by operating the camera held in a portrait position, the orientation of character data does not correspond to that of image data, which makes it difficult to read the character data.

BRIEF SUMMARY OF THE INVENTION

It is the object of the invention to provide a digital printer and a digital camera, which can provide a printing output with easy-to-read attendant information such as date information, which have a nice or good format.

To attain the object, there is provided a printer

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for printing an image based on image data and attendant information associated with the image data, comprising:

means for synthesizing the image data with the attendant information to produce print image data;

5 means for printing an image based on the print image data; and

means for changing an orientation of attendant information to be superimposed on the image, to one of a plurality of predetermined orientations,
10 the changing means changing the orientation of the attendant information in accordance with a predetermined operation by a user so that the attendant information is synthesized with the image, oriented appropriately for an orientation
15 of the image data.

Since the printer can change, to one of a plurality of predetermined orientations, the orientation of the attendant information to be superimposed on the image data, the orientation of the
20 attendant information can be easily made to correspond to the orientation of the image data by appropriately changing the orientation of the attendant information in accordance with the user's operation, for example, between the case of printing image data obtained by
25 operating a digital camera held in a landscape position, and the case of printing image data obtained by operating a digital camera held in a portrait

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position. Accordingly, the user can easily read the attendant information, and obtain a printing output that looks nice.

Moreover, According to the present invention, the orientation of the attendant information with respect to the image data is predetermined in accordance with a position on the image data, in which the attendant information is superimposed, and the changing means simultaneously changes the position and the orientation of the attendant information to be superimposed on the image data, in accordance with the user's operation of designating the position of the attendant information.

Thus relating the position of the attendant information to its orientation enables printing of the attendant information oriented appropriately for a position designated by the user. As a result, the user does not need to designate the position and the orientation of the attendant information individually. This means that the present invention has a high operability.

The processing of changing the orientation in accordance with the position can be realized by providing an operation unit including four operation sections corresponding to upward, downward, leftward and rightward, thereby setting, in accordance with a user's operation of the orientation unit, the position of the attendant information on the image data

along one of upper, lower, left and right edges of
the image data, and changing the orientation of
the attendant information in accordance with the set
position. In this case, the user can set the position
5 and the orientation of the attendant information simply
by operating one of orientation keys.

In addition, where the attendant information is
situated, for example, along the lower edge of the
image data, it can easily be shifted between the left
10 end, the center, and the right end of the lower edge,
using means for shifting the position of the attendant
information along the one of the upper, lower, left
and right edges in accordance with the user's operation
of that one of the four operation sections, which
15 corresponds to the one of the upper, lower, left
and right edges. This means further enhances the
operability of the present invention.

Additional objects and advantages of the invention
will be set forth in the description which follows, and
20 in part will be obvious from the description, or may
be learned by practice of the invention. The objects
and advantages of the invention may be realized and
obtained by means of the instrumentalities and combina-
tions particularly pointed out hereinafter.

25 BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

The accompanying drawings, which are incorporated
in and constitute a part of the specification,

illustrate presently preferred embodiments of the invention, and together with the general description given above and the detailed description of the preferred embodiments given below, serve to explain the principles of the invention.

FIG. 1A is a schematic perspective view illustrating an external appearance of a digital camera according to the embodiment of the invention;

FIG. 1B is a schematic sectional view showing the internal structure of the camera;

FIG. 2 is a block diagram illustrating the system of the digital camera shown in FIGS. 1A and 1B;

FIG. 3 is a flowchart useful in explaining the flow of processing executed by the digital camera system when it is in a print mode;

FIG. 4 is a view illustrating an example of a file structure of image data recorded in a recording medium incorporated in the digital camera system shown in FIG. 2;

FIG. 5 is a view useful in explaining processing for designating character data, executed by the key operation of the digital camera shown in FIGS. 1A and 1B;

FIGS. 6A and 6B are flowcharts useful in explaining the procedure of the processing for designating character data, executed by the key operation in the digital camera system shown in

FIG. 2; and

FIG. 7 is a schematic view useful in explaining the procedure of processing for moving character data, included in the character data designating processing and executed by the key operation in the digital camera system shown in FIG. 2.

DETAILED DESCRIPTION OF THE INVENTION

A digital camera according to the embodiment of the invention will be described with reference to the accompanying drawings.

Referring first to FIGS. 1A and 1B, the basic structure of the digital camera according to the embodiment will be described.

FIGS. 1A and 1B shows a digital still camera 11 provided with a photosensitive printer. In this camera, an image of an object to be photographed is formed on a solid-state photography element such as a CCD, is converted to image data indicating the photographed image, and is recorded on a recording medium such as a memory card. The image data can be read from the recording medium and a print image can printed out based on the image by the printer. When printing data, character or mark, such as a photography date, associated with image data can be superimposed on the print image.

FIG. 1A is a schematic perspective view of an external appearance of the digital camera 11

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when viewed from behind. As is shown in FIG. 1A,
the main body of the digital camera 11 is provided with
a release switch, i.e. a shutter button 12, a mode
switch 13, an optical viewfinder 14, an image display
5 LCD 15, a mode display LCD 16, a strobe light 17,
a cross key 18, a sheet discharge port 19, etc.

The release switch or shutter button 12 is
an operation button for inputting an instruction
to execute photography. The mode switch 13 is
10 an operation button to be used to set/change the
operation mode of the digital camera 11. The following
three operation modes are prepared for the digital
camera 11 and can be switched by the operation of
the mode switch 13.

15 1) Record/Photography mode:

In this mode, a to-be-photographed subject or
object is photographed using a solid-state photography
element such as a CCD, and image data obtained by the
photography is recorded in a recording medium.

20 2) Reproduction mode:

In this mode, data such as image data previously
obtained by photography (including image data obtained
by photography operation of another digital camera,
image data created by a computer, etc.) is read from
25 the recording medium and displayed on the image display
LCD 15.

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3) Print mode:

In this mode, data such as image data previously obtained by photography (including data on an image photographed by another digital camera, image data created by a computer, etc.) is read from the recording medium, and an image based on the image data is printed by the built-in printer. An image based on image data obtained by photography can be printed immediately after the photography.

In the print mode, the user can select the contents of character data to be superimposed on a to-be-printed image, and designate the position of the character data on the to-be-printed image by operating the cross key 18. More specifically, the cross key 18 is an operation button for changing the position of character data, and includes four scroll keys as shown. The position of character data is set upward when pushing the upward key, and set downward when pushing the downward key. Further, the orientation of character data is also set with the four scroll keys. The orientation of character data is set downward when pushing the upward key, and set upward when pushing the downward key.

The coordination of the position and orientation of character data enables printing of character data while orienting the character data optimally with respect to its position designated by the user.

Thus, the user does not have to designate the position and the orientation individually, which means that the camera has a high operability.

FIG. 1B is a schematic sectional view of the digital camera 11 when viewed from upward.

As shown in FIG. 1B, the digital camera 11 has a photography lens section 21 on the front side of the main body, and contains, in the main body, a printed circuit board 22 provided with various electronic elements, and a printing section 23. The printing section 23 functions as a photosensitive built-in printer, and comprises a film cartridge, an optical head, etc. as shown in FIG. 1B. This photosensitive built-in printer uses a self-development type photosensitive paper (a photosensitive film) as printing paper. The photosensitive paper (film) is exposed on the basis of image data to be printed, and then executes self-development, thereby forming an image thereon.

The film cartridge (also called a "film pack") contains a plurality of photosensitive paper sheets (photosensitive films) used as printing paper sheets. This film cartridge is of a detachable type and can be detachably attached to the main body of the digital camera 11, and printing paper 200 (photosensitive paper) is supplied in units of one film cartridge.

When printing, printing paper sheets 200

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(photosensitive paper sheets) are picked up one by one from the film cartridge by means of a conveyance mechanism incorporated in the printing section 23, and sequentially exposed to light by the optical head section while they are conveyed toward the paper discharge port 19. Each exposed printing paper sheet 200 is pressed by rollers for conveyance, whereby a developer contained in each printing paper sheet 200 is spread all over the to-be-developed surface. After that, each paper sheet 200 is discharged through the paper discharge port 19.

The paper discharge port 19 has a paper discharge port shutter 24. When printing is not executed, the paper discharge port shutter 24 is closed to prevent the entrance of dust from the outside.

Further, as shown in FIG. 1B, the main body of the digital camera 11 also includes a card slot 25 for inserting therein an attachable/detachable memory 100 formed of an attachable/detachable nonvolatile recording medium such as a memory card, a card lid 26 for protecting the attached memory 100, and a battery box for containing a plurality of batteries 27 used as the power supply of the digital camera 11.

(System Structure)

Referring then to FIG. 2, the system of the digital camera 11 will be described.

In addition to an operation section including

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the shutter button 12, the mode switch 13 and the cross
key 18, the image display LCD 15, the mode display LCD
16 and the strobe light 17, the digital camera 11
comprises a photography lens system 111, a photography
5 element 112, a photography circuit 113, an A/D
converting circuit 114, a system controller 115,
a memory card interface (I/F) 116, a built-in memory
117, a display control circuit 118, an image processing
section 119, an external interface (I/F) 120,
10 an compression/decompression processing section 121,
a power supply section 122, an EEPROM 123, etc.

The photography lens system 111, the photography
element 112, the photography circuit 113 and the A/D
converter circuit 114 constitute a photography section.
15 The photography lens system 111 is an optical system
that constitutes the photography lens section 21.
The photography element 112 is a solid-type photography
element for executing photoelectric conversion to
convert a subject image, formed by the photography
20 optical system 111, into an electric image signal.
This element is formed of, for example, a CCD area
sensor provided with a color filter.

The photography circuit 113 controls the
photography element 112 so as to receive image
25 information from the element 112, to adjust the speed
of the element shutter (electronic shutter) of the
element 112, and/or to adjust the gain of an image

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signal output from the element 112. An image signal output from the photography circuit 113 is supplied to the A/D converter circuit 114, where it is converted into a digital image signal.

5 The system controller 115 is a CPU for controlling each unit incorporated in the digital camera 11, and is formed of, for example, a one-chip microcomputer. In this embodiment, the system controller 115 has an attendant information synthesizing/controlling
10 section 301 for controlling the process of synthesizing character data, as well as a control section for photographing, recording and printing an image. The attendant information synthesizing/controlling section 301 has an attendant information synthesizing/
15 controlling section 301 for simultaneously changing the position and the orientation of character data associated with image data. This attendant information synthesizing/controlling section 301 will be described later in detail with reference to FIGS. 5 to 7.

20 The memory card interface (I/F) 116 is provided for accessing the attachable/detachable memory 100 to read/write data. Image data is written into and read from the memory 100 via the memory card interface (I/F) 116.

25 The built-in memory 117 is a buffer area used for temporarily holding photography image data obtained by the photography section. This buffer area is

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also used as a working area for image processing.
The image processing section 119 creates image data
for printing by superimposing character data associated
with image data on the image data. This synthesizing
5 processing by the image processing section 119 or
the compression/decompression processing by the
compression/decompression processing section 121 are
executed on the built-in memory 117.

The display control circuit 118 has a function
10 of displaying image data on the image display LCD 15,
and displays an original image or character data on
a display section under the control of the system
controller 115 when executing the character data
designating processing. The external interface 120 is
15 provided for enabling communication with an external
computer or other electron devices via a communication
interface such as RS232, IEEE1394, etc. The external
interface 120 transmits or receives various control
data items, image data, etc.

20 The compression/decompression processing section
121 compresses to-be-recorded image data obtained by
photography in a compression format such as JPEG (Joint
Photographic Coding Experts Group), and decompresses
to-be-printed (or to-be-reproduced) compressed image
25 data read from the attachable/detachable memory 100.

The power supply section 122 is a power supply
circuit for supplying each unit of the digital camera

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11 with operation power output from the batteries contained in the digital camera 11 or from an external AC power supply. The EEPROM 123 stores, for example, parameters for various image processing steps.

5 The digital camera 11 also includes, as units constituting the printing section 23, a to-be-printed image creating section 201, a printing buffer memory 202, a head driving circuit 203, an optical head section 204, a drive control circuit 205, a driving
10 section 206, a film cartridge 207, a cartridge sensor 208, etc., as is shown in FIG. 2.

 The to-be-printed image creating section 201 executes various types of image processing, such as resizing processing, gamma correction processing, color
15 correction processing, etc., on to-be-printed image data stored in the built-in memory 117 for obtaining image data suitable for printing. The section 201 rasterizes the image data for printing, and develops it in units of one line in the printing buffer memory 202.
20 The image data developed in the printing buffer memory 202 is supplied to the optical head section 204 via the head driving circuit 203. The optical head section 204 is formed of three optical heads corresponding to light beams R, G and B, and an LCD shutter for controlling,
25 in units of one pixel, interruption/transmission of light emitted from the optical heads. The control of the open period of the LCD shutter enables setting of

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(Print mode)

When the user has designated the print mode, the system controller 115 reads an image data file from the attachable/detachable memory 100, then controls the compression/decompression processing section 121 so as to decompress main image data contained in the image data file, and displays the decompressed data on the image display LCD 15 (step S11). The image data file includes main image data, thumbnail image data and character data such as a photography date, a file name, etc. as shown in FIG. 4.

After a to-be-printed image is selected (if the

answer to the question of the step S12 is YES), the system controller 115 inquires the user, by displaying, for example, a message on the image display LCD 15, whether or not character data associated with the image should be printed together with the image (step S14).

If the user designates the printing of the character data (if the answer to the question of the step S14 is YES), the system controller 115 executes character data designating processing (step S15), in which to-be-printed character data is selected, and the position and the orientation of the character data in the to-be-printed image are set. FIG. 5 shows manners of setting of the position and the orientation of character data.

As is shown in FIG. 5, character data such as a photography date is placed in a lower portion of the image and oriented upward, when the downward key included in the cross key 18 has been pushed. Accordingly, image data obtained by the digital camera 11 held in the landscape position is oriented upward as shown in FIG. 5, i.e. displayed in a correct position. Thus, when printing this image data, character data can be set in an appropriate position and oriented appropriately simply by pushing the downward key.

On the other hand, when the user has pushed the rightward key of the cross key 18, character data such as a photography date is placed on the right hand of

an image and oriented leftward. Similarly, when the user has pushed the leftward key of the cross key 18, character data date is placed on the left hand of an image and oriented rightward.

5 Image data obtained by operating the digital camera held in the portrait position is displayed on the screen such that it is orientated leftward or rightward. Therefore, when printing this image data, character data can be set in an appropriate position
10 and oriented appropriately with respect to the orientation of the image data, by pushing the rightward or leftward key.

 Further, when the user has pushed the upward key of the cross key 18, character data such as
15 a photography date is placed in an upper portion of the image and orientated downward as shown in FIG. 5. Accordingly, in the case of printing, for example, image data obtained by operating the digital camera held upside down, i.e. printing image data in
20 a landscape position and upside down state, character data can be set in an appropriate position and oriented appropriately simply by pushing the upward key.

 As described above, the relationship between the position and the orientation of character data is
25 predetermined so that the character data will be always placed in a lower portion of image data irrespective of the orientation of the image data, and therefore

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the position and the orientation of the character data can be set simultaneously simply by operating the cross key 18. It is a matter of course that the relationship between the position and the orientation of character data may be predetermined so that the character data will be always placed in an upper portion of image data irrespective of the orientation of the image data.

After the position and the orientation of character data is determined on the LCD screen by character data designating processing, the system controller 115 executes, using the image processing section 119, image processing for obtaining image data for printing with character data superimposed thereon, thereby starting printing processing and outputting an image from the printer section (step S16). The output image is basically identical to a displayed one. Accordingly, the operation of the cross key 18 is also an operation for designating on which portion of the printing paper sheet 200 the character data is printed.

When the user has input an instruction to print another image (step S17), the system controller 115 re-executes the processing at the step S11, et seq. When the user has input an instruction to finish the printing (if the answer to the question of the step S17 is NO), the system controller 115 executes power-off processing (step S18), thereby finishing the processing.

(Character Data Designating Processing)

Referring now to the flowchart of FIGS. 6A and 6B, the procedure of processing for designating character data, executed at the step S15 of FIG. 3, will be described in detail.

In the character data designating processing, the system controller 115 first determines, on the basis of the operation by the user, that any of date, time and file name should be printed, and then displays an image with date, time or file name data superimposed thereon (steps S21 - S25). The initial position of the date, time or file name data is a lower portion of the displayed image, and the orientation of the character data is set upward as usual.

After that, the system controller 115 determines whether or not the printing position of the character data should be designated, on the basis of whether or not the cross key 18 has been operated (step S26). If no orientation key of the cross key 18 is operated (if the answer to the question of the step S26 is NO), or if the downward key (lower button) of the cross key 18 is pushed, the system controller 115 situates the character data along the lower edge of the image without revolving it, i.e. keeping it oriented upward (in a default state) (step S31).

When the user has pushed the rightward key (right-hand button) (if the answer to the question of

a step S28 is YES), the system controller 115 situates the character data along the right-hand edge of the image, orienting it leftward by revolving the character data counterclockwise through 90 degrees (step S32).

5 When the user has pushed the upward key (upper button) (if the answer to the question of a step S29 is YES), the system controller 115 situates the character data along the upper edge of the image, orienting it downward by revolving the character
10 data counterclockwise or clockwise through 180 degrees (step S33).

 When the user has pushed the leftward key (left-hand button) (if the answer to the question of a step S30 is YES), the system controller 115 situates the
15 character data along the left edge of the image, orienting it rightward by revolving the character data clockwise through 90 degrees (step S34).

 Subsequently, the system controller 115 detects whether or not the user has pushed the same orientation
20 key more than once (step S35). If the same orientation key has been pushed more than once (if the answer to the question of the step S35 is YES), the system controller 115 cyclically shifts the position of the character data, along an edge indicated by the
25 orientation key, to "central position", "left end position", "right end position", and again "central position", "left end position" ... in this order each

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On the other hand, if the present position of the character data is not "right end position" along the edge indicated by the presently pushed orientation key, it is determined whether or not the present position of

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a position on image data, designated by the user, in a state in which the character data is oriented optimally with respect to the designated position. Thus, the digital camera has a high operability.

5 Further, the position of character data can be shifted along an edge indicated by a presently pushed orientation key, by pushing the orientation key more than once. As a result, adjustment of the position of the character data can be executed easily.

10 Although in the embodiment, character data is used as attendant information to be superimposed on to-be-printed image data, the same processing can be executed even when synthesizing image data with a figure or a mark prepared in advance and printing
15 the resultant data. Moreover, the processing may be modified such that at first, only the orientation of character data is changed by a predetermined button operation by the user, and the position of the character data is changed later, if necessary, by
20 a predetermined button operation by the user.

In addition, although the control of synthesizing attendant information according to the embodiment is suitable especially for a digital camera that has a printing function, it is also applicable, for example,
25 to a video printer having an attendant information synthesizing function, since the position and orientation of attendant information can be determined

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efficiently by a simple button operation. A structure obtained by removing the photography section from the digital camera of the embodiment may be used as the video printer.

5 As described above, the present invention can easily provide a printing output with easy-to-read attendant information, which looks nice.

 Additional advantages and modifications will readily occur to those skilled in the art. Therefore,
10 the invention in its broader aspects is not limited to the specific details and representative embodiments shown and described herein. Accordingly, various modifications may be made without departing from the spirit or scope of the general inventive concept as
15 defined by the appended claims and their equivalents.

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WHAT IS CLAIMED IS:

1. A printer for printing an image based on image data and attendant information associated with the image data, comprising:

5 means for synthesizing the image data with the attendant information to produce print image data;

means for printing an image based on the print image data; and

10 means for changing an orientation of attendant information to be superimposed on the image, to one of a plurality of predetermined orientations, said changing means changing the orientation of the attendant information in accordance with a predetermined operation by a user so that the attendant
15 information is synthesized with the image, oriented appropriately for an orientation of the image data.

2. The printer according to claim 1, wherein the orientation of the attendant information with respect to the image data is predetermined in accordance with
20 a position on the image data, in which the attendant information is superimposed, and the changing means changes the position and the orientation of the attendant information to be superimposed on the image, in accordance with a user's operation of designating
25 the position of the attendant information.

3. The printer according to claim 1, further comprising an operation unit including four operation

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sections corresponding to upward, downward, leftward
and rightward, wherein the changing means sets, in
accordance with a user's operation of the orientation
unit, the position of the attendant information on the
5 image data along one of upper, lower, left and right
edges of the image data, and changes the orientation of
the attendant information in accordance with the set
position.

4. The printer according to claim 3, wherein the
10 changing means includes means for shifting the position
of the attendant information along the one of the
upper, lower, left and right edges in accordance with
a user's operation of that one of the four operation
sections, which corresponds to the one of the upper,
15 lower, left and right edges.

5. The printer according to claim 1, wherein the
attendant information includes character data.

6. A digital camera comprising:
means for forming an image of a to-be-photographed
20 subject;

means for converting the image into electronic
image data;

means for generating attendant information
associated with the image data;

25 means for synthesizing the attendant information
with the image data to produce print image data;

means for printing an image based on the print

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image data; and

means for changing, to one of a plurality of predetermined orientations, an orientation of the attendant information to be synthesized with the image data, the changing means changing the orientation of the attendant information in accordance with a user's predetermined operation so that the attendant information is synthesized with the image data, orientated appropriately for an orientation of the image data.

7. The digital camera according to claim 6, wherein the orientation of the attendant information with respect to the image data is predetermined in accordance with a position of the attendant information on the image data to be synthesized with the attendant information, and the changing means changes the position and the orientation of the attendant information to be synthesized with the image data, in accordance with a user's operation for designating the position of the attendant information.

8. The digital camera according to claim 6, further comprising an operation unit including four operation sections corresponding to upward, downward, leftward and rightward, wherein the control means sets, in accordance with a user's operation of the orientation unit, the position of the attendant information on the image data along one of upper,

lower, left and right edges of the image data, and changes the orientation of the attendant information in accordance with the set position.

9. The digital camera according to claim 8,
5 wherein the changing means includes means for shifting the position of the attendant information along the one of the upper, lower, left and right edges in accordance with a user's operation of that one of the four operation sections, which corresponds to the one
10 of the upper, lower, left and right edges.

10. The digital camera according to claim 6, wherein the attendant information includes character data.

11. A printer apparatus that can simultaneously
15 print image data and character string data associated with the image data, comprising:

means for displaying to-be-printed image data on a preview screen;

a manual operation member to be manually operated
20 in accordance with an orientation of the displayed image data;

a control section for controlling, in accordance with data input by operating the manual operation member, a position and an orientation in which
25 character string data is printed when printing the image data; and

a print data processing section for synthesizing

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the image data with the character string data output from the character string data position control section, and then printing the synthesized data.

12. The printer apparatus according to claim 11,
5 wherein the position and the orientation in which the character string data is printed are selected from a plurality of predetermined combinations of positions and orientations.

13. An electronic camera equipped with a printer
10 apparatus that can simultaneously print image data obtained by photography and character string data associated with the image data, comprising:

means for converting image data concerning
a photographed subject into an electronic signal;

15 means for displaying to-be-printed image data on a preview screen;

a manual operation member to be manually operated in accordance with an orientation of the displayed image data;

20 a control section for controlling, in accordance with data input by operating the manual operation member, a position and an orientation in which character string data is printed when printing the image data; and

25 a print data processing section for synthesizing the image data with the character string data output from the character string data position control

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section, and then printing the synthesized data.

14. The printer apparatus according to claim 13,
wherein the position and the orientation in which the
character string data is printed are selected from a
5 plurality of predetermined combinations of positions
and orientations.

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ABSTRACT OF THE DISCLOSURE

A system controller 115 has a function of changing the position and the orientation of character data to be superimposed on the image data, in accordance with the operation of one of orientation keys. Specifically, when a downward key has been pushed, the character data is superimposed on a lower portion of the image data, not revolved and but oriented upward. When a rightward key has been pushed, the character data is revolved counterclockwise through 90 degrees, and is located along the right-hand edge of the image data, oriented leftward. When an upward key has been pushed, the character data is revolved through 180 degrees, and is located along the upper edge of the image data, oriented downward. Further, when a leftward key has been pushed, the character data is revolved clockwise through 90 degrees, and is located along the left-hand edge of the image data, oriented rightward. When synthesizing attendant information such as character data with image data and printing the resultant data, the position and the orientation of the attendant information can be efficiently set by a simple operation.

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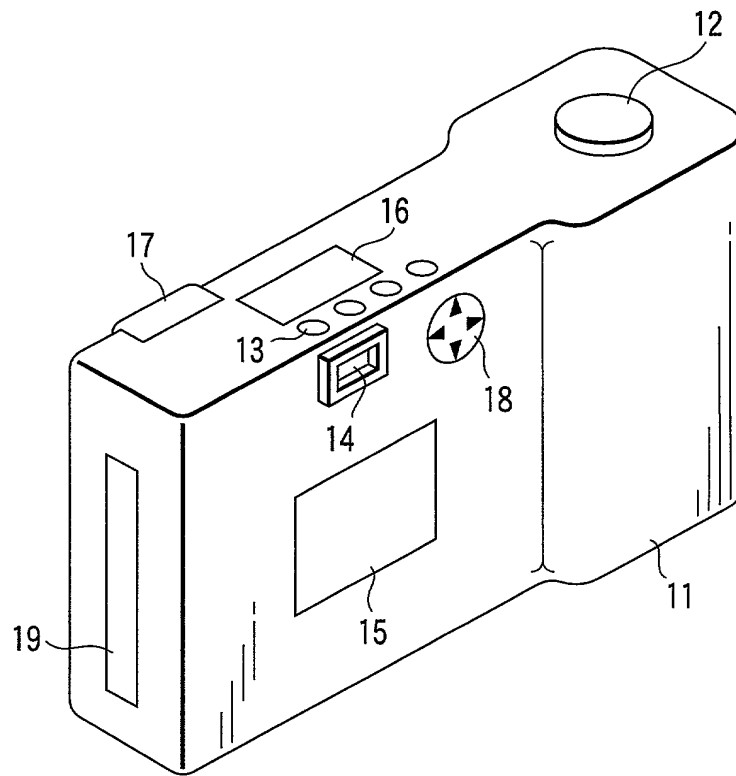


FIG. 1A

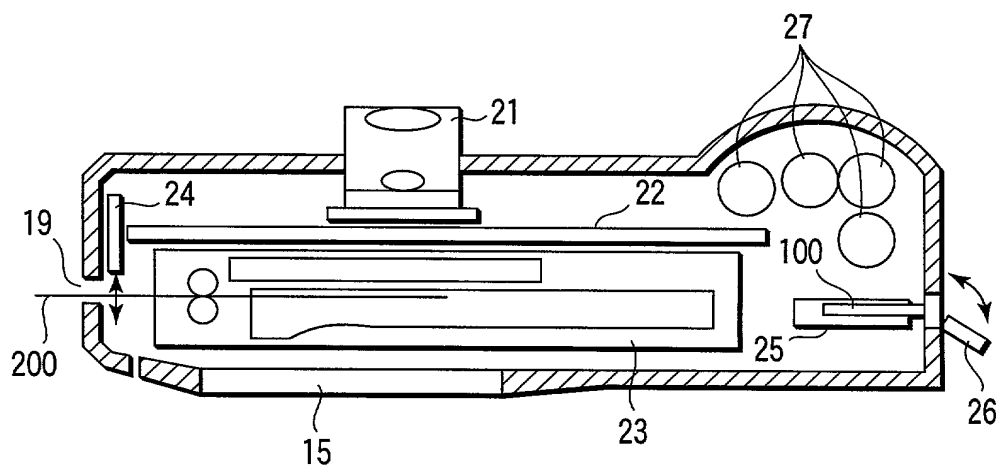


FIG. 1B

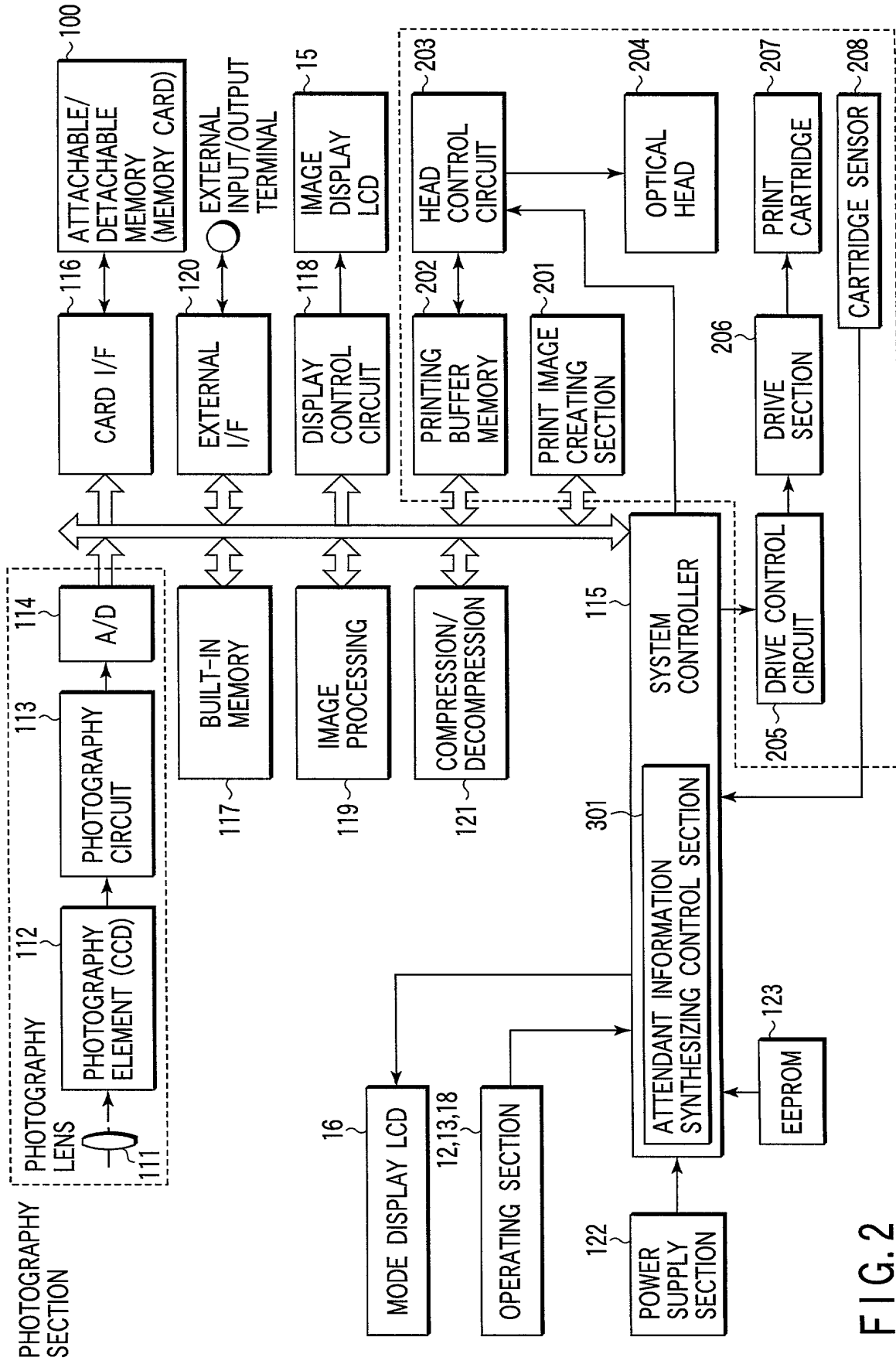


FIG. 2

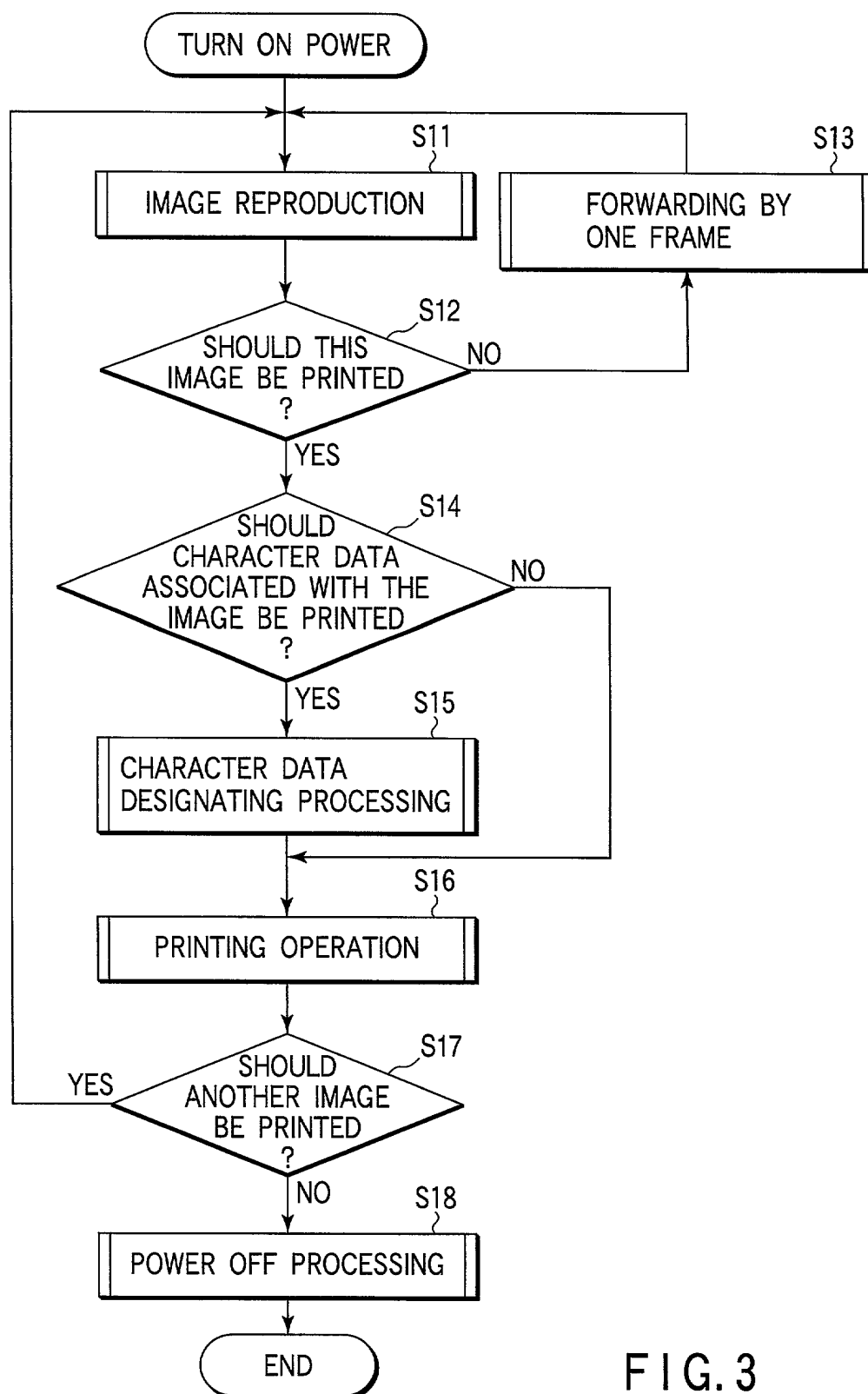


FIG. 3

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FIG. 4

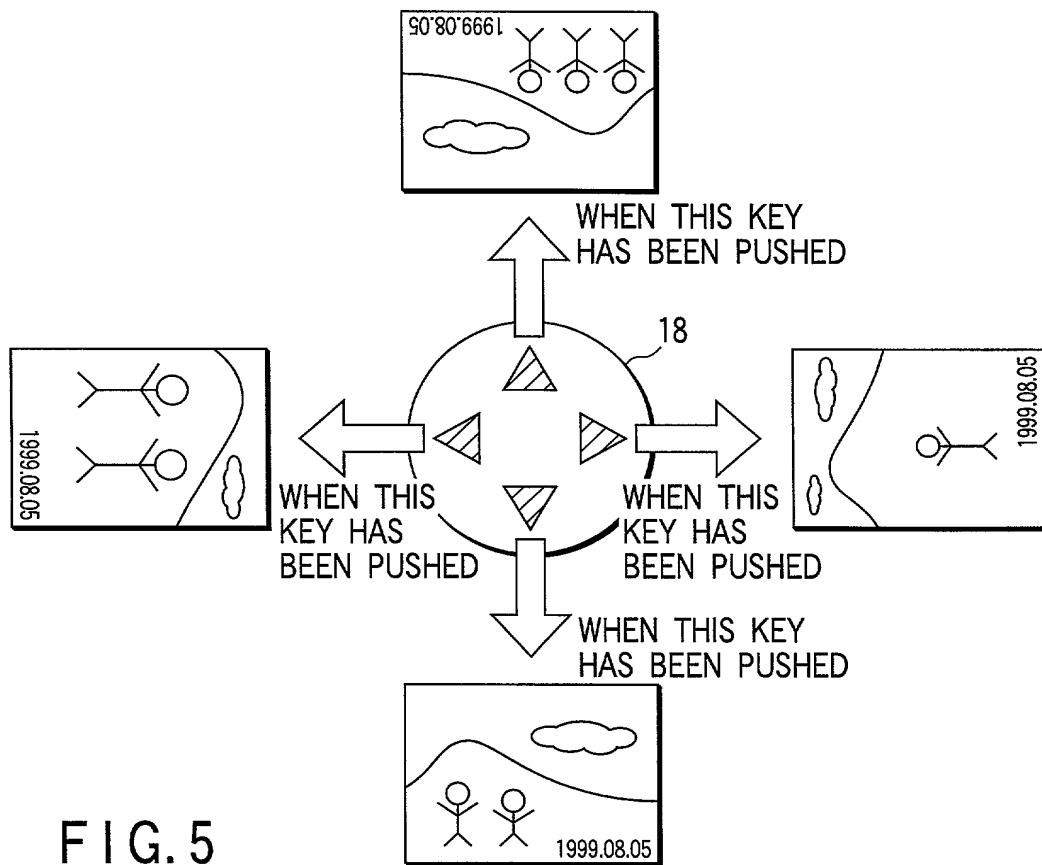
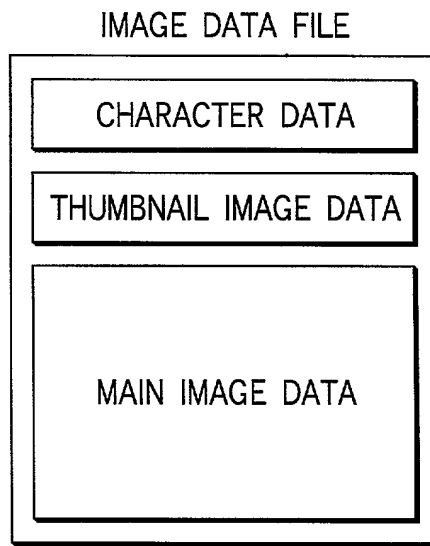


FIG. 5

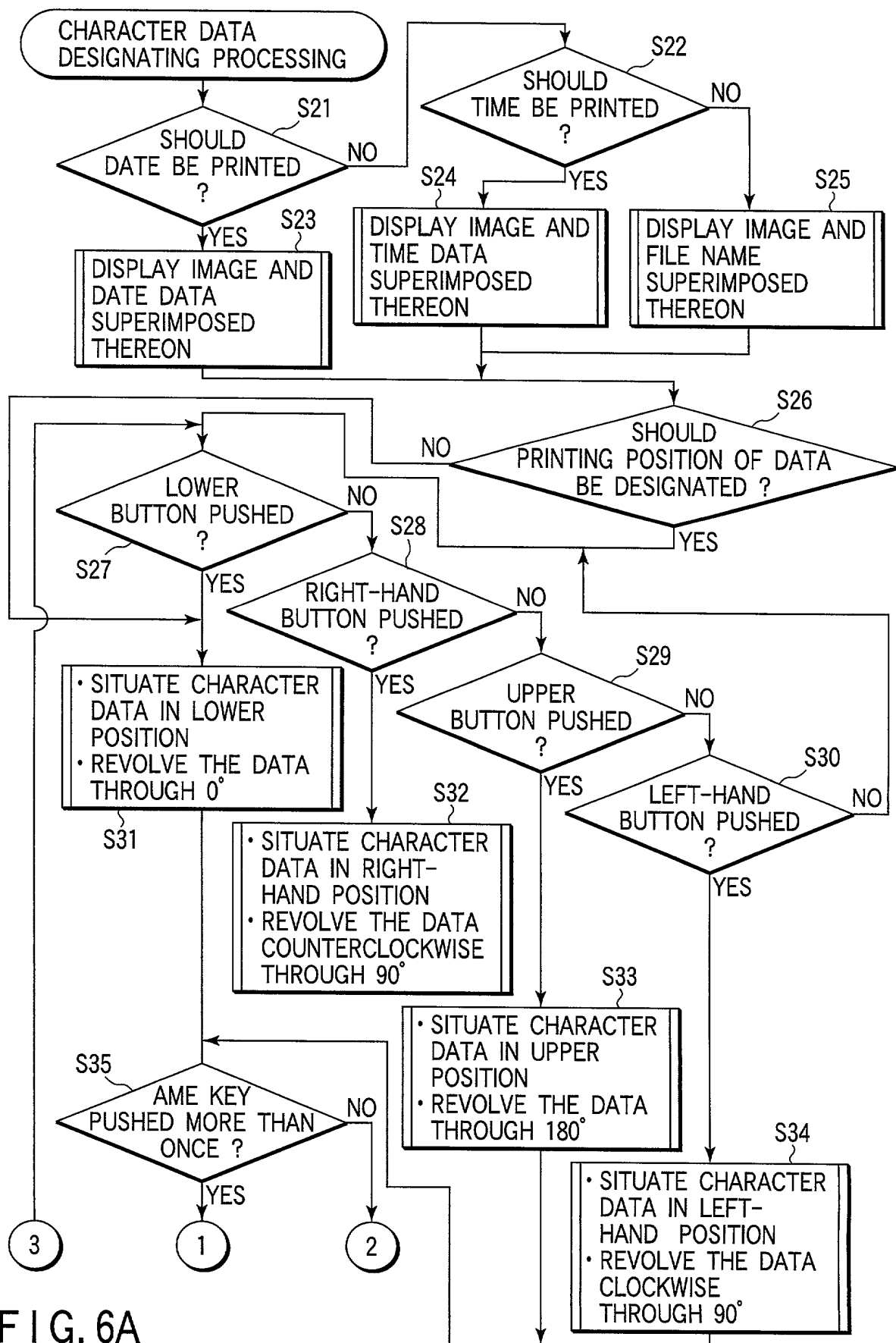


FIG. 6A

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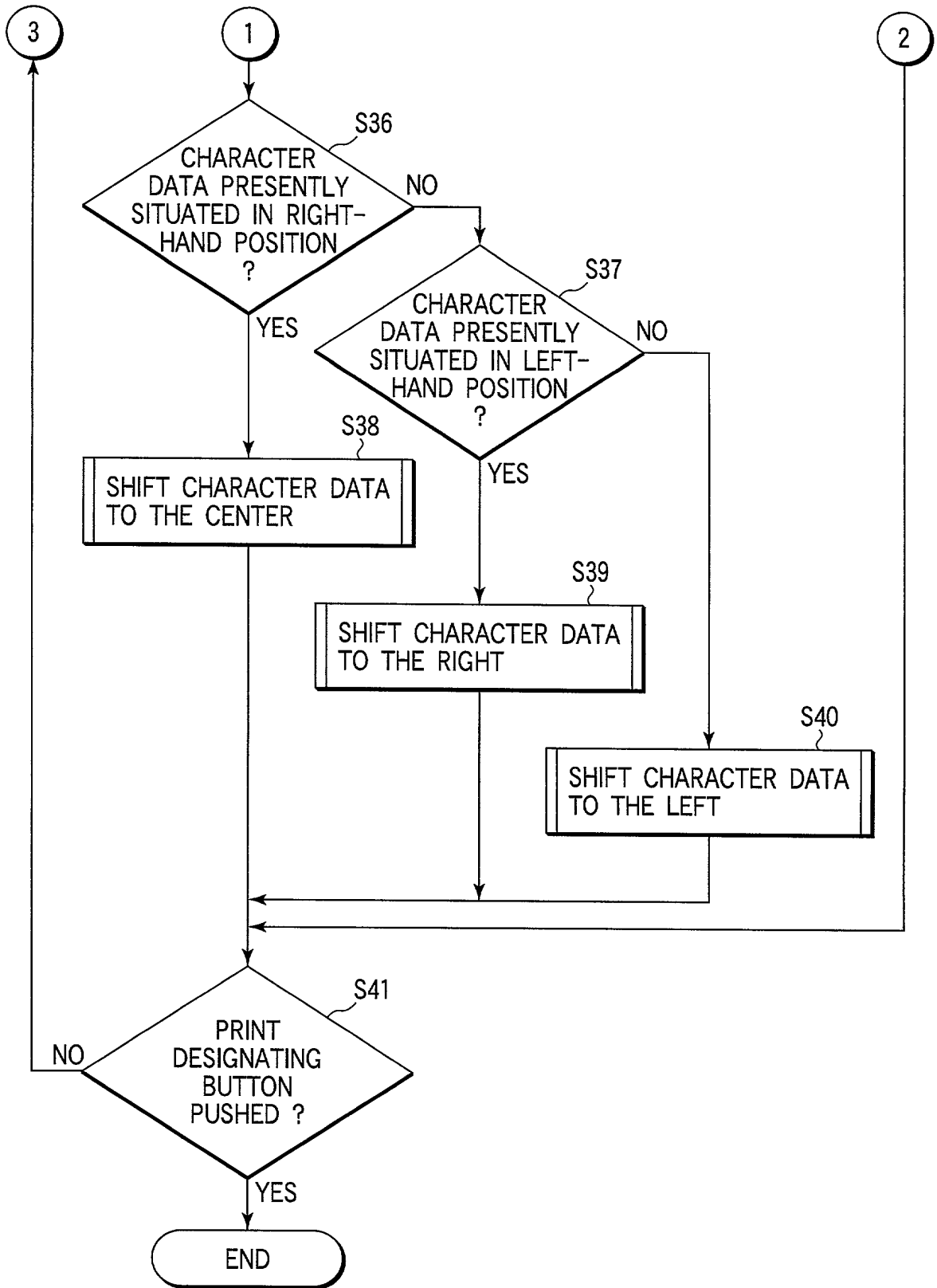


FIG. 6B

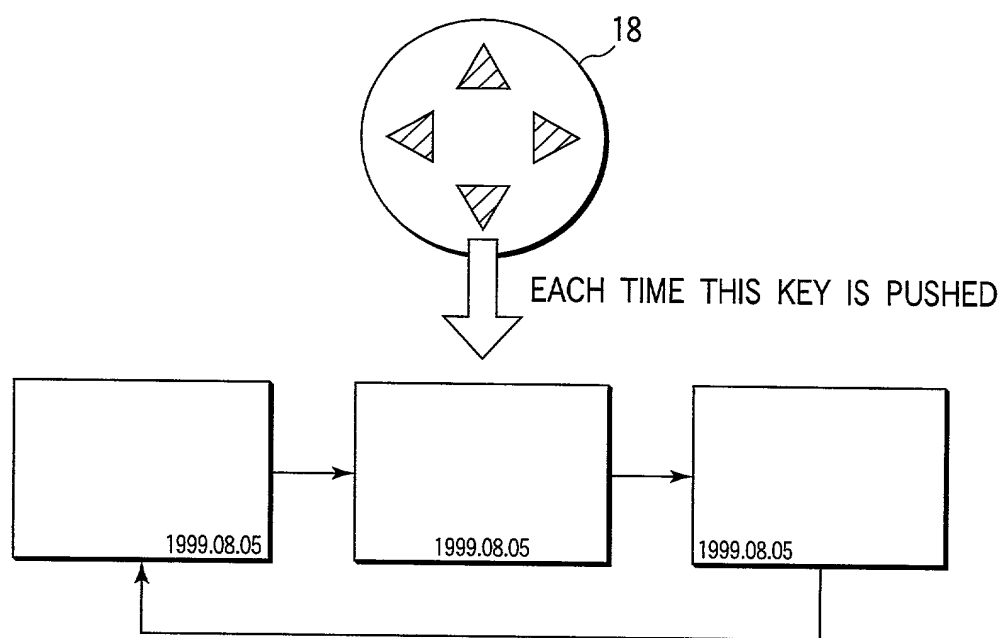


FIG. 7

Declaration Power of Attorney For Patent Application

特許出願宣言

Japanese Language Declaration

私は、下欄に氏名を記載した発明として、以下の通り宣言する：

As a below named inventor, I hereby declare that:

私の住所、郵便の宛先および国籍は、下欄に氏名に続いて記載したとおりであり、

My residence, post office address and citizenship are as stated below next to my name,

名称の発明に関し、請求の範囲に記載した特許を求める主題の本来の、最初にして唯一の発明者である（一人の氏名のみが下欄に記載されている場合）か、もしくは本来の、最初にして共同の発明者である（複数の氏名が下欄に記載されている場合）と信じ、

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

デジタルプリンタ及びデジタルカメラ

DIGITAL PRINTER AND DIGITAL CAMERA

その明細書を
（該当するほうに印を付す）

The specification of which
(check one)

☒ ここに添付する。

☒ is attached hereto.

☐ _____月____日に

☐ was filed on _____

as Application Serial No.

出願番号第 _____ 号として

_____ and was amended on

提出し、 _____ 月 _____ 日に補正した。
（該当する場合）

_____ (if applicable)

私は、前記のとおり補正した請求の範囲を含む前記明細書の内容を検討し、理解したことを陳述する。

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

私は、連邦規則法典第37部第1章第56条(a)項に従い、本願の審査に所要の情報を開示すべき義務を有することを認める。

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, Section 1.56(a).

Japanese Language Declaration

私は、合衆国法典第35部第119条、第172条、又は第365条に基づく下記の外国特許出願又は発明者証出願の外国優先権利益を主張し、さらに優先権の主張に係る基礎出願の出願日前の出願日を有する外国特許出願又は発明者証出願を以下に明記する：

I hereby claim foreign priority benefits under Title 35, United States Code Sec. 119, Sec. 172 or Sec. 365 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior foreign application(s)
先の外国出願

Priority Claimed
優先権の主張

| 11-274505 (Number) (番号) | JAPAN (Country) (国名) | 28/09/1999 (Day/Month/Year Filed) (出願年月日) | <input checked="" type="checkbox"/> Yes あり | <input type="checkbox"/> No なし |
|-------------------------------|----------------------------|---|--|--------------------------------------|
| | | | <input type="checkbox"/> | <input type="checkbox"/> |
| | | | <input type="checkbox"/> | <input type="checkbox"/> |
| | | | <input type="checkbox"/> | <input type="checkbox"/> |
| | | | <input type="checkbox"/> | <input type="checkbox"/> |

私は、合衆国法典第35部第120条に基づく下記の合衆国特許出願の利益を主張し、本願の請求の範囲各項に記載の主題が合衆国法典第35部第112条第1項に規定の態様で先の合衆国出願に開示されていない限度において、先の出願の出願日と本願の国内出願日又はPCT国際出願日の間に公表された連邦規則法典第37部第1章第56条(a)項に記載の所要の情報を開示すべき義務を有することを認める。

I hereby claim the benefit of Title 35, United States Code, Sec. 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, Sec. 112, I acknowledge the duty to disclose any material information as defined in Title 37, Code of Federal Regulations, Sec. 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

| | | |
|-----------------------------|------------------------|---|
| (Application No.) (出願番号) | (Filing Date) (出願日) | (Status: Patented, Pending, Abandoned) (現況: 特許許可済、係属中、放棄済) |
| (Application No.) (出願番号) | (Filing Date) (出願日) | (Status: Patented, Pending, Abandoned) (現況: 特許許可済、係属中、放棄済) |

私は、ここに自己の知識に基づいて行った陳述がすべて真実であり、自己の有する情報及び信ずるところに従って行った陳述で真実であると信じ、更に故意に虚偽の陳述等を行った場合、合衆国法典第18部第1001条により、罰金もしくは禁固に処せられるか、又はこれらの刑が併科され、又はかかる故意による虚偽の陳述が本願ないし本願に対して付与される特許の有効性を損なうことがあることを認識して、以上の陳述を行ったことを宣言する。

I hereby declare that all statements made herein of my own knowledge are true; and further that all statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Japanese Language Declaration

(日本語宣言書)

委任状：私は、下記の発明者として、本出願に関する一切の手続きを米特許商標局に対して遂行する弁理士または代理人として、下記の者を指名いたします。
(弁理士、または代理人の氏名及び登録番号を明記のこと)

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (list name and registration number)

And I hereby appoint Samuel H. Weiner (Reg.No.18,510), Robert C. Faber (Reg.No.24,322), Edward A. Meilman (Reg.No.24,735), Stanley H. Lieberstein (Reg.No.22,400), Steven L. Weisburd (Reg.No.27,409), Max Moskowitz (Reg.No.30,576), Stephen A. Soffen (Reg.No.31,063), James A. Finder (Reg.No.30,173), William O. Gray, III (Reg.No.30,944), Louis C. Dujmich (Reg.No.30,625) and Douglas A. Miro (Reg.No.31,643) each of whose address is 1180 Avenue of The Americas, New York, New York 10036-8403, or any one of them, my attorneys with full power of substitution and revocation, to prosecute this application and to transact all business in the Patent & Trademark Office connected therewith, and request that correspondence be directed to Ostrolenk, Faber, Gerb & Soffen, LLP, 1180 Avenue of The Americas, New York, New York 10036-8403.

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New York,
New York 10036-8403

直通電話連絡先：

Direct Telephone Calls to: (name and telephone number)
Telephone No. (212)382-0700
Facsimile No. (212)382-0888

| | |
|----------------------------|--|
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| 同発明者の署名 日付 | Inventor's signature Date Takeshi Suzuki Sept. 22, 2000 |
| 住 所 日本国あきる野市 | Residence Akiruno-shi, Japan |
| 国 籍 日本 | Citizenship JAPAN |
| 郵便の宛先 日本国東京都八王子市久保山町2-3 | Post Office Address c/o Intellectual Property Department, OLYMPUS OPTICAL CO., LTD. |
| オリンパス光学工業株式会社 知的財産部内 | 2-3, Kuboyama-cho, Hachioji-shi, Tokyo, Japan |

(第二以降の共同発明者に対しても同様に記載し、署名をすること。)

(Supply similar information and signature for second and subsequent joint inventors.)